Appendix E-3: Eastern Straits of Juan de Fuca

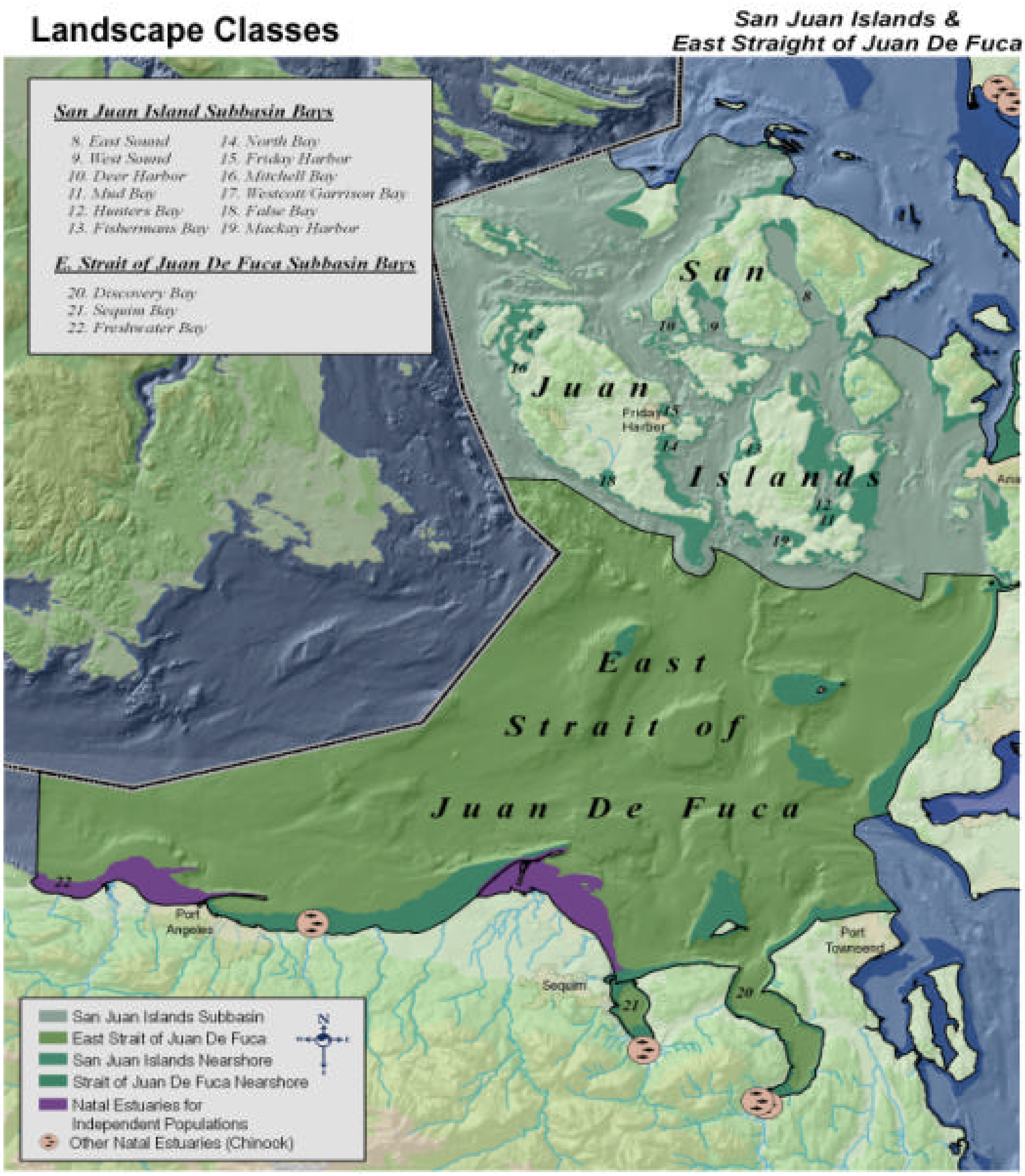

Figure E-3.1: San Juan Islands and Eastern Strait of Juan de Fuca Landscape Classes

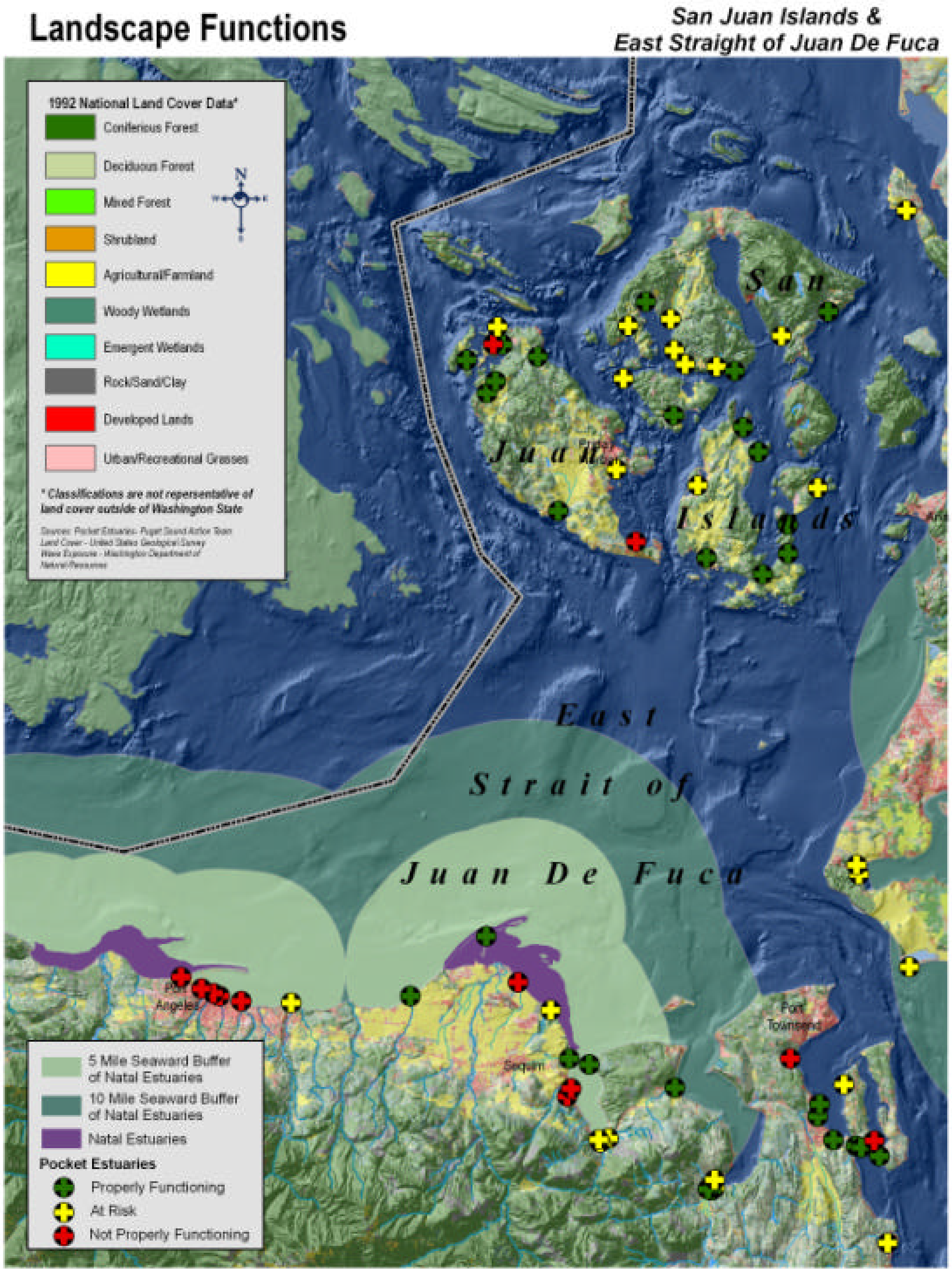

Figure E-3.2. Landscape Functions for the San Juan Islands and Eastern Strait of Juan de Fuca Sub-Basins.

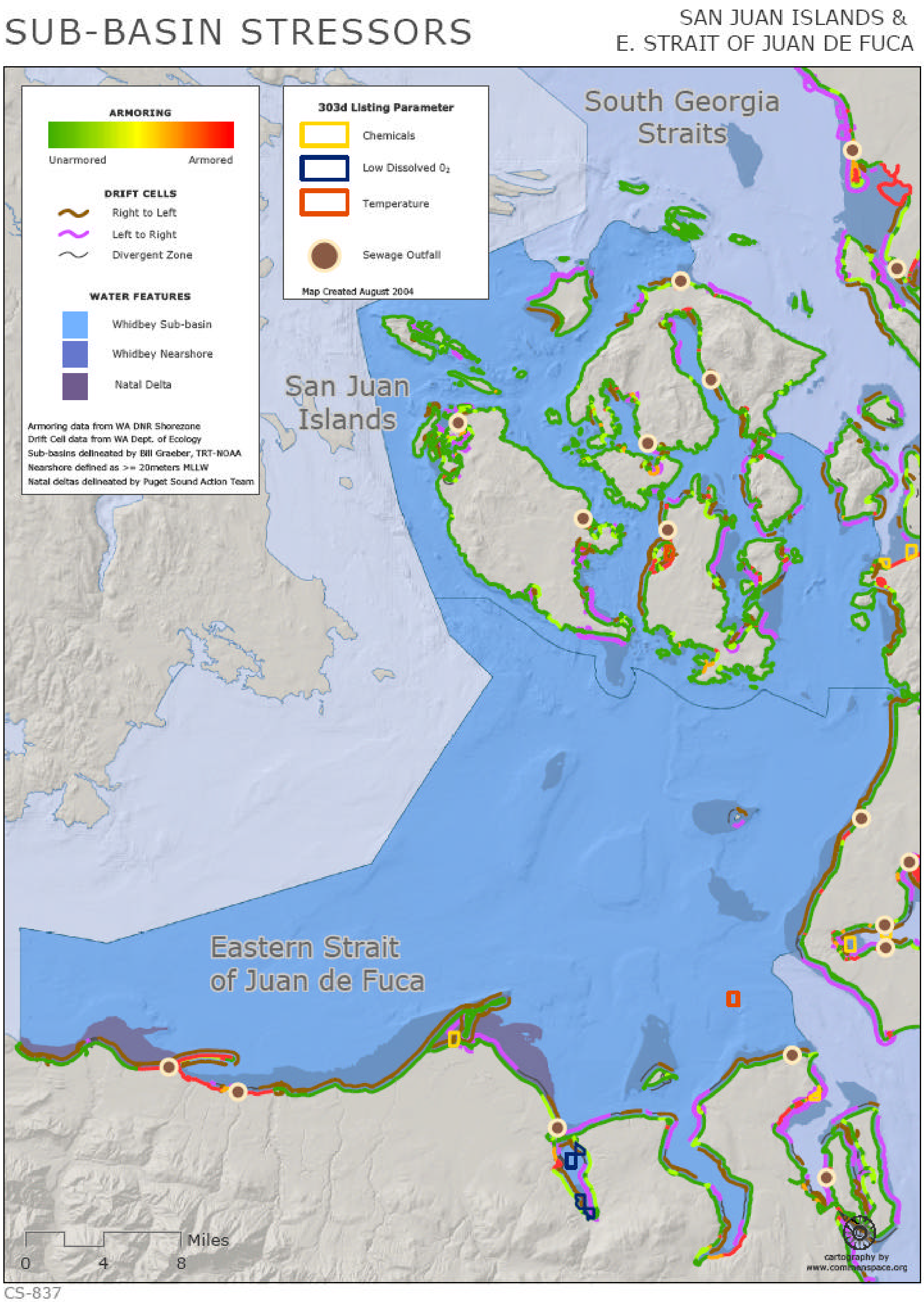

Figure E-3.3 Stressors for the San Juan Islands and Eastern Strait of Juan de Fuca SubBasins.

Figure E-3.4 Eastern Strait of Juan de Fuca sub-basin pocket estuary locations, likely Chinook functions, and observed stressors

Pocket Estuary Identifier	Latitude	Longitude	Photo ID #	Freshwater (Y/N)	Likely Chinook Functions			Shoreline Development	Urbanization	Diking and Filling	Susceptibility to spills and discharges	Aquaculture related substrate alterations	Vulnerability to Sea Level Rise	Final Chinook Function Score		
					Feeding	Osmoreg.	Refuge									
ES1 - Fairmount	47.992	122.879	010522-131518	Y	x	x	x						x	AR	PF = Property Functioning	
ES2 - Snow Creek	47.99	122.882	010522-131528	Y	x	x	x			x	x		x	PF	NPF=Not Properly Functioni	
ES3 - Salmon Creek	47.991	122.886	010522-131530	Y	x	x	x	x		x	x		x	PF	AR=At Risk	
ES4 - Maynard	47.998	122.879	010522-131700	N	x		x	x	x	x	x		x	AR		
ES5 - Eagle Creek	48.065	122.926	010522-132206	Y	x	x	x							PF		
ES6 - Paradise Cove	48.08	123.021	0205311218_050	N	x		x	x						PF		
ES7 - Blyn	48.026	122.997	0205311221_075	N	x		x	x		x	x		x	AR		
ES8 - JimmyComeLately	48.023	123.006	0205311222_079	Y	x	x	x	x	x	x	x			AR		
ES9 - Dean Creek	48.025	123.008	0205311222_080	Y	x	x		x	x	x	x		x	AR		
ES10	48.056	123.044	0205311223_099	Y	x	x		x	x	x	x			NPF		
ES11 - Johnson Creek	48.062	123.04	0205311224_103	Y	x	x		x	x	x	x		x	NPF		
ES12 - Bell Creek Lagoon	48.084	123.043	0205311234_123	Y	x	x	x		x				x	PF		
ES13 - Glenn Creek	48.119	123.065	0205311237_138	Y	x	x	x		x					AR		
ES14 - Cassalery Creek	48.139	123.102	0205311238_147	Y	x	x		x	x	x	x		x	NPF		
ES15 - Dungeness Spit	48.172	123.139	0205311246_185	N	x		x						x	PF		
ES16 - Siebert Creek	48.126	123.22	0205311259_218	Y	x	x	x							PF		
ES17 - Morse Creek	48.118	123.351	0205311309_249	Y	x	x	x	x	x				x	AR		
ES18 - White/Ennis	48.118	123.406	0205311311_262	Y	x	x		x	x	x	x		x	NPF		
ES19 - Peabody Creek	48.121	123.43	0205311312_270	Y	x			x	x	x	x		x	NPF		
ES20 - Valley Creek	48.123	123.437	0205311312_272	Y				x	x	x	x		x	NPF		
ES21 - Tumwater Creek	48.126	123.45	0205311312_276	N				x	x	x	x		x	NPF		
ES22 - Ediz Lagoon	48.134	123.473	0205311320_312	N	x		x	x	x	x	x		x	NPF		

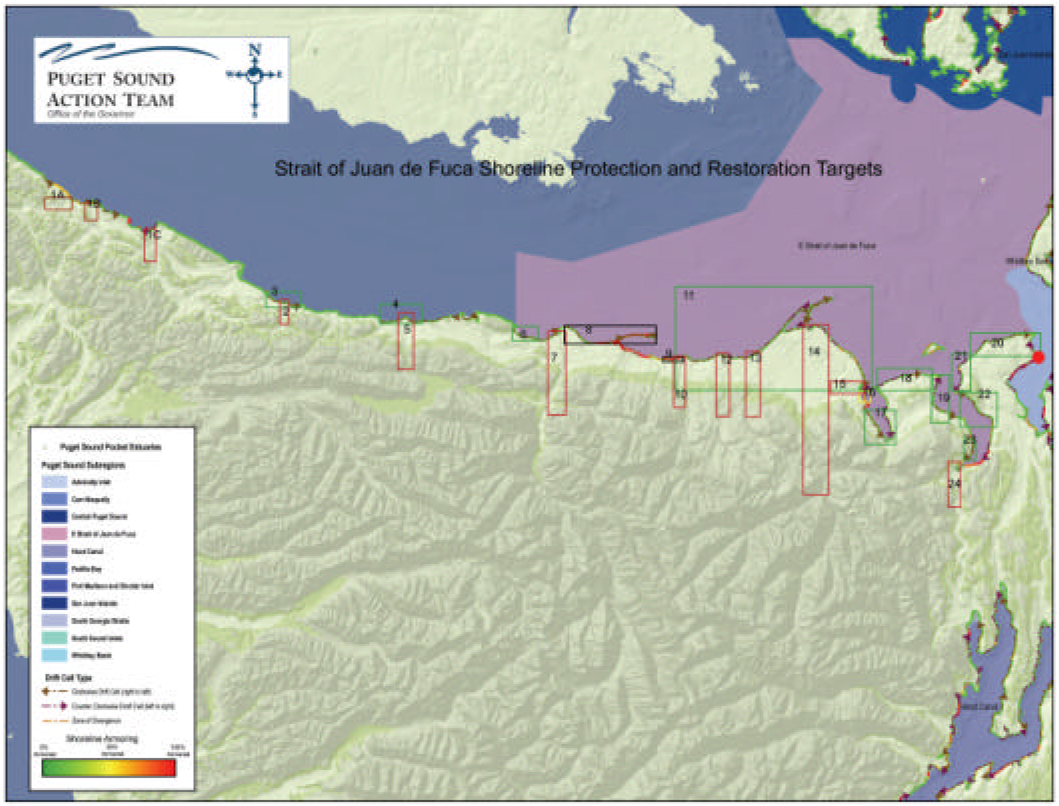

Figure E-3.5 Eastern Strait of Juan de Fuca sub-basin analysis of drift cells and shoreline armoring

Strait of Juan de Fuca

Boxes 1A,B and C – Sandy beaches on the outer Strait of Juan de Fuca appear to be "pocket" beaches between otherwise rocky headlands. As such, the longshore component of sediment transport is less important than maintaining the source of upland sediments from the Sekiu, Hoko and Clallam rivers.

Boxes 2 and 3 – The long drift cell that extends eastward from the mouth of Jim Creek distributes sediment from the adjacent sandy bluff as well as sediment coming downstream from Deep Creek supporting a number of depositional features. To maintain this unique structure will require protecting both upland sediment sources from the creek and long-term sediment delivery from the eroding bluff.

Boxes 4 and 5 – This drift cell starts on the bluffs near Murdock creek and extends eastward to Tongue Point. Much of the sediment that is transported comes from the Lyre River and smaller streams within the drift cell.

Boxes 6 and 7 – The shorelines of western Freshwater Bay are somewhat protected by a rocky headland. This drift cell interacts with the considerable historic Elwha River delta.

It is expected that river sediments will once again be deposited onto this delta and into the drift cell as a result of dam removal commencing in 2007.

Box 8 – The high sandy bluffs east of the Elwha River historically built the extensive depositional structure of Ediz Hook along with river sediments. In recent years, armoring of the bluff base east of Dry Creek has increased effectively removing those bluff sediments from the drift cell. Ediz Hook continues to erode and is now also protected by extensive armoring. This unique drift cell may need to be studied to understand the relative contribution of bluff and river sediments over time in maintaining Ediz Hook structure. New river sediments coming down from the Elwha are expected to move along the shoreline but it is uncertain whether the armoring of the transport and depositional sections of this drift cell will preclude settlement of these sediments onto the beach and the hook. At the very least, aggressive protection of the function of bluffs from the River mouth to Dry Creek is recommended.

Boxes 9-14 – The unique structure of Dungeness Spit and Dungeness Bay is the result of a complex interaction of deltaic sediment input from the Dungeness River interacting with bluff sediments on all shorelines East of Port Angeles to the base of the spit. The strong longshore drift eastward from Port Angeles prevents any significant deposition of sediments until they reach the spit. Morse Creek, Siebert Creek, McDonald Creek and other small drainages may contribute sediment to the system in lesser degrees or during seasonal floods and so that process should also be protected. Beaches in Box 9 are currently heavily armored, most likely the result of the perception of increased wave action beyond the "shadow effect" of Ediz Hook. However, it's quite possible sediments from Box 9 bluffs would also contribute to the Dungeness Spit and should be considered for beach nourishment or some "softer" method of shoreline treatment.

Boxes 15, 16, 17 and 18 – Longshore drift processes within these drift cells define the complex depositional structures within Sequim Bay. Upland sediment sources from Box 15 historically interacted with the depositional end of the large drift cell (Box 11) described above containing Dungeness Spit and sediments traveling westward from the drift cell in box 18 and northward in box 16. Some restoration of armored shorelines in Box 16 should be considered to maintain the structure of the pocket estuary. Drift cells traveling southeasterly within Box 17 aid in the formation of extensive mudflats at the mouth of Jimmycomelately Creek, Dean Creek and other drainages at the head of Sequim Bay.

Boxes 19-22 – These largely unarmored shorelines within and near Discovery Bay support a number of depositional features at the terminal ends of their drift cells. In many cases the convergence of neighboring drift cells forms the point bar feature. These features are often associated with a wide intertidal and shallow subtidal shelf creating an extensive area within the photic zone. This is important here because the waters of outer Discovery Bay and the Eastern Strait are otherwise quite deep.

Boxes 23 and 24 – The structure of the Salmon and Snow Creek estuary is as a result of interactions between the southwesterly bluff sediment transport from box 23 and deltaic sedimentation from Box 24.